

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ **1997Pe27**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. A. Rodionov and S. Sakharov, Balraj Singh		NDS 104, 497 (2005)	10-Feb-2005

1997Pe27: E=160 MeV. Measured $E\gamma$, $\gamma\gamma$, particle- γ coin using GASP spectrometer consisting of 40 Compton-suppressed Ge detectors and an 80-element BGO ball. Light charged particles were detected with the ISIS ball.

 ^{132}Nd Levels

E(level) [†]	J π [‡]	E(level) [†]	J π [‡]	E(level) [†]	J π [‡]	E(level) [†]	J π [‡]
0 [#]	0 ⁺	4621.5 ^a 10	15 ⁻	8335.8 ^d 12	(22,23)	12693.7 [#] 16	32 ⁺
213.0 [#] 5	2 ⁺	4907.9 ^b 10	15 ⁻	8527.4 ^{&} 15	24 ⁻	12884.6 ^c 16	32 ⁺
611.0 [#] 7	4 ⁺	4997.4 ^{&} 11	16 ⁻	8530.6 [@] 14	24 ⁺	13198.6 ^e 16	(31,32)
1022.1 [@] 8	4 ⁺	5188.5 [#] 11	18 ⁺	8726.6 ^c 12	24 ⁺	13278.9 ^b 18	33 ⁻
1133.2 [#] 8	6 ⁺	5369.5 ^a 12	17 ⁻	8808.7 ^e 12	(23,24)	13814.8 ^d 16	(32,33)
1634.1 [@] 8	6 ⁺	5434.5 [@] 11	18 ⁺	8981.9 ^b 15	25 ⁻	14051.7 [#] 17	34 ⁺
1713.1 [#] 9	8 ⁺	5671.9 ^b 12	17 ⁻	9079.7 [#] 14	26 ⁺	14095.6 ^c 16	34 ⁺
1884.4 ^a 8	5 ⁻	5734.4 ^{&} 12	18 ⁻	9147.5 ^a 15	25 ⁻	14466.7 ^e 17	(33,34)
2181.1 [@] 9	8 ⁺	6071.6 [#] 11	20 ⁺	9293.8 ^d 13	(24,25)	14547.9 ^b 19	35 ⁻
2226.4 ^a 8	7 ⁻	6164.5 ^c 11	18 ⁺	9664.4 ^{&} 16	26 ⁻	15113.8 ^d 17	(34,35)
2313.0 [#] 9	10 ⁺	6166.5 ^a 13	19 ⁻	9670.6 ^c 13	26 ⁺	15366.6 ^c 17	36 ⁺
2346.2 ^{&} 9	6 ⁻	6224.5 ^e 11	(17,18)	9722.6 [@] 15	26 ⁺	15507.7 [#] 18	36 ⁺
2692.0 ^a 9	9 ⁻	6339.5 11	18 ⁺	9800.7 ^e 13	(25,26)	15801.7 ^e 17	(35,36)
2698.9 ^{&} 9	8 ⁻	6382.6 [@] 12	20 ⁺	9947.9 ^b 16	27 ⁻	15903.9 ^b 20	37 ⁻
2852.0 [@] 10	10 ⁺	6435.9 ^b 13	19 ⁻	10209.7 [#] 15	28 ⁺	16482.8 ^d 18	(36,37)
2950.0 [#] 10	12 ⁺	6557.4 ^{&} 13	20 ⁻	10325.8 ^d 14	(26,27)	16722.6 ^c 18	38 ⁺
2962.1 ^b 9	9 ⁻	6590.3 ^d 13	(18,19)	10342.5 ^a 16	27 ⁻	17041.7 [#] 18	38 ⁺
3110.8 ^{&} 9	10 ⁻	6994.6 ^c 11	20 ⁺	10678.6 ^c 14	28 ⁺	17204.7 ^e 18	(37,38)
3257.2 ^a 9	11 ⁻	7015.7 [#] 12	22 ⁺	10865.7 ^e 14	(27,28)	17348.9 ^b 20	39 ⁻
3289.9 [@] 10	12 ⁺	7018.5 ^e 11	(19,20)	10893.4 ^{&} 17	28 ⁻	17925.8 ^d 19	(38,39)
3498.0 ^b 9	11 ⁻	7054.5 ^a 14	21 ⁻	10982.9 ^b 17	29 ⁻	18157.6 ^c 19	40 ⁺
3636.5 [#] 10	14 ⁺	7072.6 11	20 ⁺	10986.6 [@] 15	28 ⁺	18654.7 [#] 19	40 ⁺
3660.4 ^{&} 9	12 ⁻	7232.9 ^b 14	21 ⁻	11412.7 [#] 15	30 ⁺	18678.7 ^e 19	(39,40)
3850.8 [@] 10	14 ⁺	7416.6 [@] 13	22 ⁺	11421.8 ^d 15	(28,29)	18885.9 ^b 21	41 ⁻
3908.3 ^a 10	13 ⁻	7438.3 ^d 12	(20,21)	11600.5 ^a 17	29 ⁻	19443.8 ^d 19	(40,41)
4153?		7488.4 ^{&} 14	22 ⁻	11748.6 ^c 15	30 ⁺	19676.6 ^c 19	42 ⁺
4165.1 ^b 10	13 ⁻	7850.6 ^c 11	22 ⁺	11998.7 ^e 15	(29,30)	20226.7 ^e 19	(41,42)
4305.4 ^{&} 10	14 ⁻	7879.5 ^e 12	(21,22)	12091.9 ^b 18	31 ⁻	20354.7 [#] 20	42 ⁺
4376.5 [#] 11	16 ⁺	8017.7 [#] 13	24 ⁺	12212.4 ^{&} 17	30 ⁻	20519.9 ^b 22	43 ⁻
4383.5 11	16 ⁺	8047.5 ^a 15	23 ⁻	12313.6 [@] 16	30 ⁺	21046.8 ^d 20	(42,43)
4580.6 [@] 10	16 ⁺	8081.9 ^b 15	23 ⁻	12584.8 ^d 16	(30,31)	21849.7 ^e 20	(43,44)

[†] From least-squares fit to $E\gamma$'s, assuming 0.5 keV uncertainty for each γ ray.

[‡] As proposed by **1997Pe27**. The assignments are based on measured $\gamma\gamma(\theta)$ (DCO) values, but such values are not quoted in the paper by **1997Pe27**.

Band(A): g.s. band.

@ Band(B): 4⁺ band.

& Band(C): 6⁻ band.

Continued on next page (footnotes at end of table)

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ **1997Pe27** (continued) ^{132}Nd Levels (continued)^a Band(D): 5⁻ band.^b Band(E): Highly-deformed (or SD-1) band #1. Percent population=2.5. Configuration= $(\nu h_{11/2}, \alpha=+1/2) \otimes (\nu i_{13/2}, \alpha=+1/2)$.^c Band(F): Highly-deformed (or SD-2) band #2. Percent population=3.0. Configuration= $\nu 1/2[411]^{-1}(\nu i_{13/2}, \alpha=+1/2)$.^d Band(G): Highly-deformed (or SD-3) band #3. Percent population=2.4. Configuration= $\nu 5/2[402]\nu i_{13/2}$. Highly-deformed bands #3 and #4 are signature partners.^e Band(g): Highly-deformed (or SD-4) band #4. Percent population=1.8. Configuration= $\nu 5/2[402]\nu i_{13/2}$. Highly-deformed bands #3 and #4 are signature partners. $\gamma(^{132}\text{Nd})$

Numerical values of intensities are not available, although width of the transition arrows in the level scheme figure shows a measure of intensity.

E_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
204	4580.6	16 ⁺	4376.5	16 ⁺	
213	213.0	2 ⁺	0	0 ⁺	
214	3850.8	14 ⁺	3636.5	14 ⁺	
241	3498.0	11 ⁻	3257.2	11 ⁻	
246	5434.5	18 ⁺	5188.5	18 ⁺	
257	4165.1	13 ⁻	3908.3	13 ⁻	
269.8	2962.1	9 ⁻	2692.0	9 ⁻	
286.2	4907.9	15 ⁻	4621.5	15 ⁻	Additional information 1.
311	6382.6	20 ⁺	6071.6	20 ⁺	
340	3289.9	12 ⁺	2950.0	12 ⁺	
342	2226.4	7 ⁻	1884.4	5 ⁻	
353	2698.9	8 ⁻	2346.2	6 ⁻	
397	4305.4	14 ⁻	3908.3	13 ⁻	
398	611.0	4 ⁺	213.0	2 ⁺	
403	3660.4	12 ⁻	3257.2	11 ⁻	
411	1022.1	4 ⁺	611.0	4 ⁺	
412	3110.8	10 ⁻	2698.9	8 ⁻	
420 @	7438.3	(20,21)	7018.5	(19,20)	
438	3289.9	12 ⁺	2852.0	10 ⁺	
441 @	7879.5	(21,22)	7438.3	(20,21)	
456 @	8335.8	(22,23)	7879.5	(21,22)	
462	2346.2	6 ⁻	1884.4	5 ⁻	
465	2692.0	9 ⁻	2226.4	7 ⁻	
472	2698.9	8 ⁻	2226.4	7 ⁻	
473 @	8808.7	(23,24)	8335.8	(22,23)	
501	1634.1	6 ⁺	1133.2	6 ⁺	
513	2226.4	7 ⁻	1713.1	8 ⁺	
522	1133.2	6 ⁺	611.0	4 ⁺	
536	3498.0	11 ⁻	2962.1	9 ⁻	
547	2181.1	8 ⁺	1634.1	6 ⁺	
550	3660.4	12 ⁻	3110.8	10 ⁻	
561	3850.8	14 ⁺	3289.9	12 ⁺	
565	3257.2	11 ⁻	2692.0	9 ⁻	
580	1713.1	8 ⁺	1133.2	6 ⁺	
592	2226.4	7 ⁻	1634.1	6 ⁺	
600	2313.0	10 ⁺	1713.1	8 ⁺	
612	1634.1	6 ⁺	1022.1	4 ⁺	
637	2950.0	12 ⁺	2313.0	10 ⁺	

Continued on next page (footnotes at end of table)

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ **1997Pe27** (continued) $\gamma(^{132}\text{Nd})$ (continued)

E_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π
645	4305.4	14 ⁻	3660.4	12 ⁻	1034	7416.6	22 ⁺	6382.6	20 ⁺
651	3908.3	13 ⁻	3257.2	11 ⁻	1035	10982.9	29 ⁻	9947.9	27 ⁻
667	4165.1	13 ⁻	3498.0	11 ⁻	1039	8527.4	24 ⁻	7488.4	22 ⁻
671	2852.0	10 ⁺	2181.1	8 ⁺	1062	9079.7	26 ⁺	8017.7	24 ⁺
686	3636.5	14 ⁺	2950.0	12 ⁺	1065	10865.7	(27,28)	9800.7	(25,26)
692	4997.4	16 ⁻	4305.4	14 ⁻	1070	11748.6	30 ⁺	10678.6	28 ⁺
713	4621.5	15 ⁻	3908.3	13 ⁻	1093	2226.4	7 ⁻	1133.2	6 ⁺
730	4580.6	16 ⁺	3850.8	14 ⁺	1096	11421.8	(28,29)	10325.8	(26,27)
733	7072.6	20 ⁺	6339.5	18 ⁺	1100	9147.5	25 ⁻	8047.5	23 ⁻
735.9	2962.1	9 ⁻	2226.4	7 ⁻	1109	12091.9	31 ⁻	10982.9	29 ⁻
737	5734.4	18 ⁻	4997.4	16 ⁻	1114	8530.6	24 ⁺	7416.6	22 ⁺
740	4376.5	16 ⁺	3636.5	14 ⁺	1130	10209.7	28 ⁺	9079.7	26 ⁺
743	4907.9	15 ⁻	4165.1	13 ⁻	1133	11998.7	(29,30)	10865.7	(27,28)
747	4383.5	16 ⁺	3636.5	14 ⁺	1136	12884.6	32 ⁺	11748.6	30 ⁺
748	5369.5	17 ⁻	4621.5	15 ⁻	1137	9664.4	26 ⁻	8527.4	24 ⁻
751	1884.4	5 ⁻	1133.2	6 ⁺	1163	12584.8	(30,31)	11421.8	(28,29)
764	5671.9	17 ⁻	4907.9	15 ⁻	1187	13278.9	33 ⁻	12091.9	31 ⁻
764	6435.9	19 ⁻	5671.9	17 ⁻	1192	9722.6	26 ⁺	8530.6	24 ⁺
778	7850.6	22 ⁺	7072.6	20 ⁺	1195	10342.5	27 ⁻	9147.5	25 ⁻
794	7018.5	(19,20)	6224.5	(17,18)	1200	13198.6	(31,32)	11998.7	(29,30)
797	6166.5	19 ⁻	5369.5	17 ⁻	1203	11412.7	30 ⁺	10209.7	28 ⁺
797	7232.9	21 ⁻	6435.9	19 ⁻	1211	14095.6	34 ⁺	12884.6	32 ⁺
798	3110.8	10 ⁻	2313.0	10 ⁺	1213	2346.2	6 ⁻	1133.2	6 ⁺
805.8#	3498.0	11 ⁻	2692.0	9 ⁻	1229	10893.4	28 ⁻	9664.4	26 ⁻
812	5188.5	18 ⁺	4376.5	16 ⁺	1230	13814.8	(32,33)	12584.8	(30,31)
823	6557.4	20 ⁻	5734.4	18 ⁻	1249.‡ 2	2962.1	9 ⁻	1713.1	8 ⁺
830	6994.6	20 ⁺	6164.5	18 ⁺	1258	11600.5	29 ⁻	10342.5	27 ⁻
848	7438.3	(20,21)	6590.3	(18,19)	1264	10986.6	28 ⁺	9722.6	26 ⁺
849	8081.9	23 ⁻	7232.9	21 ⁻	1268	14466.7	(33,34)	13198.6	(31,32)
854	5434.5	18 ⁺	4580.6	16 ⁺	1269	14547.9	35 ⁻	13278.9	33 ⁻
856	7850.6	22 ⁺	6994.6	20 ⁺	1271	15366.6	36 ⁺	14095.6	34 ⁺
861	7879.5	(21,22)	7018.5	(19,20)	1274	1884.4	5 ⁻	611.0	4 ⁺
876	8726.6	24 ⁺	7850.6	22 ⁺	1281	12693.7	32 ⁺	11412.7	30 ⁺
883	6071.6	20 ⁺	5188.5	18 ⁺	1299	15113.8	(34,35)	13814.8	(32,33)
888	7054.5	21 ⁻	6166.5	19 ⁻	1313	15366.6	36 ⁺	14051.7	34 ⁺
898	8335.8	(22,23)	7438.3	(20,21)	1319	12212.4	30 ⁻	10893.4	28 ⁻
900	8981.9	25 ⁻	8081.9	23 ⁻	1320@	8335.8	(22,23)	7015.7	22 ⁺
901	3850.8	14 ⁺	2950.0	12 ⁺	1327	12313.6	30 ⁺	10986.6	28 ⁺
907.9	4165.1	13 ⁻	3257.2	11 ⁻	1335	15801.7	(35,36)	14466.7	(33,34)
929	8808.7	(23,24)	7879.5	(21,22)	1356	15903.9	37 ⁻	14547.9	35 ⁻
931	7488.4	22 ⁻	6557.4	20 ⁻	1356	16722.6	38 ⁺	15366.6	36 ⁺
944	4580.6	16 ⁺	3636.5	14 ⁺	1358	14051.7	34 ⁺	12693.7	32 ⁺
944	7015.7	22 ⁺	6071.6	20 ⁺	1369	16482.8	(36,37)	15113.8	(34,35)
944	9670.6	26 ⁺	8726.6	24 ⁺	1403	17204.7	(37,38)	15801.7	(35,36)
948	6382.6	20 ⁺	5434.5	18 ⁺	1435	18157.6	40 ⁺	16722.6	38 ⁺
958	9293.8	(24,25)	8335.8	(22,23)	1443	17925.8	(38,39)	16482.8	(36,37)
966	9947.9	27 ⁻	8981.9	25 ⁻	1445	17348.9	39 ⁻	15903.9	37 ⁻
977	3289.9	12 ⁺	2313.0	10 ⁺	1456	15507.7	36 ⁺	14051.7	34 ⁺
979	2692.0	9 ⁻	1713.1	8 ⁺	1474	18678.7	(39,40)	17204.7	(37,38)
986	2698.9	8 ⁻	1713.1	8 ⁺	1518	19443.8	(40,41)	17925.8	(38,39)
992	9800.7	(25,26)	8808.7	(23,24)	1519	19676.6	42 ⁺	18157.6	40 ⁺
993	8047.5	23 ⁻	7054.5	21 ⁻	1534	17041.7	38 ⁺	15507.7	36 ⁺
1002	8017.7	24 ⁺	7015.7	22 ⁺	1537	18885.9	41 ⁻	17348.9	39 ⁻
1008	10678.6	28 ⁺	9670.6	26 ⁺	1548	20226.7	(41,42)	18678.7	(39,40)
1023	1634.1	6 ⁺	611.0	4 ⁺	1603	21046.8	(42,43)	19443.8	(40,41)
1032	10325.8	(26,27)	9293.8	(24,25)	1613	18654.7	40 ⁺	17041.7	38 ⁺

Continued on next page (footnotes at end of table)

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ **1997Pe27** (continued) $\gamma(^{132}\text{Nd})$ (continued)

E_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π
1623	21849.7	(43,44)	20226.7	(41,42)	1806	6994.6	20 ⁺	5188.5	18 ⁺
1634	20519.9	43 ⁻	18885.9	41 ⁻	1830	7018.5	(19,20)	5188.5	18 ⁺
1700	20354.7	42 ⁺	18654.7	40 ⁺	1848	6224.5	(17,18)	4376.5	16 ⁺
1711	8726.6	24 ⁺	7015.7	22 ⁺	1884	7072.6	20 ⁺	5188.5	18 ⁺
1779	7850.6	22 ⁺	6071.6	20 ⁺	1956	6339.5	18 ⁺	4383.5	16 ⁺
1788	6164.5	18 ⁺	4376.5	16 ⁺	2072 [@]	6224.5	(17,18)	4153?	

[†] E_γ 's are quoted to nearest keV by **1997Pe27**, but in authors' figure 1, it is stated that the uncertainty varies from 0.2 to 1 keV.

The evaluators have assumed 0.5 keV for least-squares adjustment.

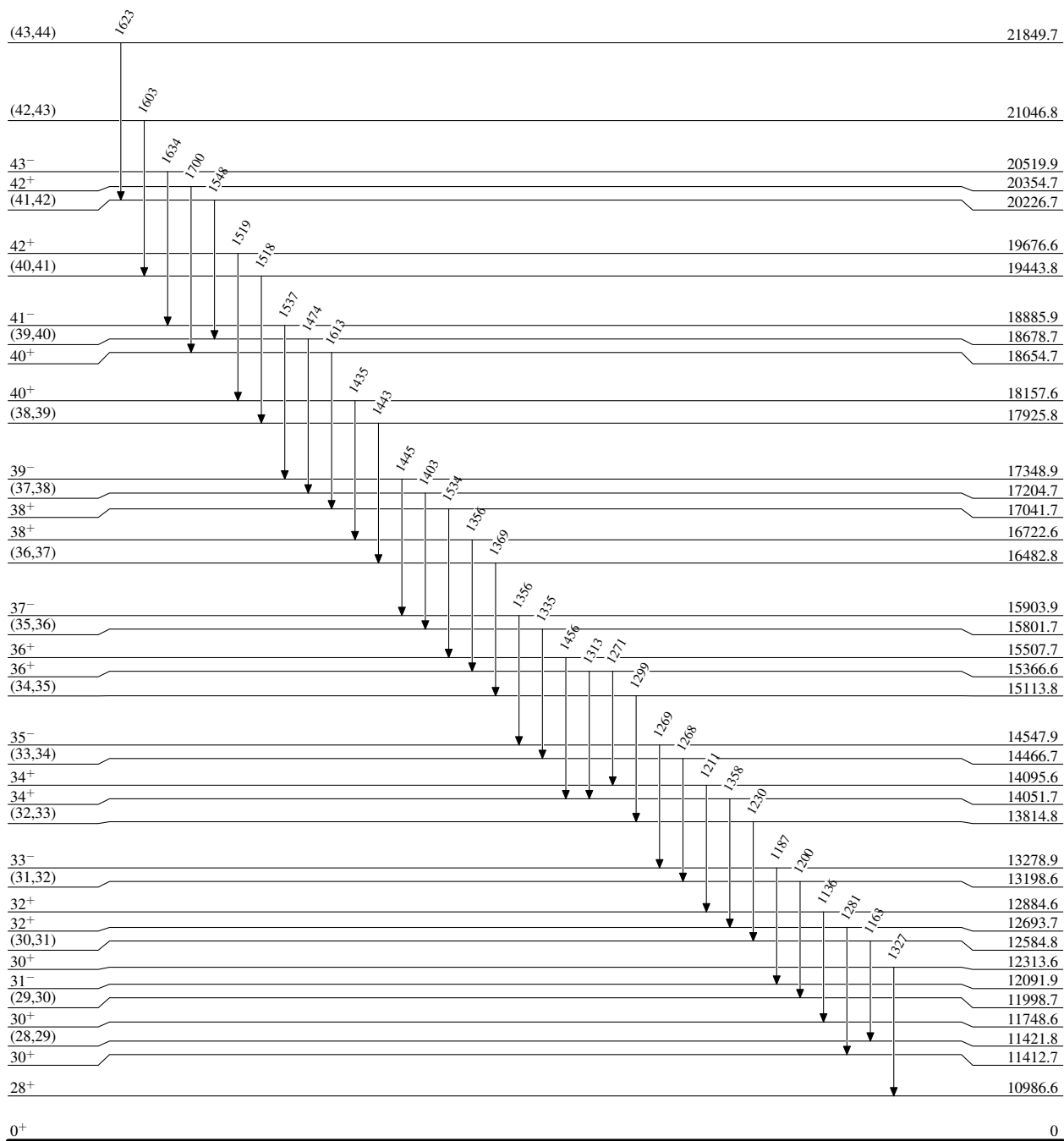
[‡] $\Delta J=1$, dipole from DCO=0.61 20.

[#] $\Delta J=2$, Q from DCO=1.0 1.

[@] Placement of transition in the level scheme is uncertain.

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n})$ 1997Pe27

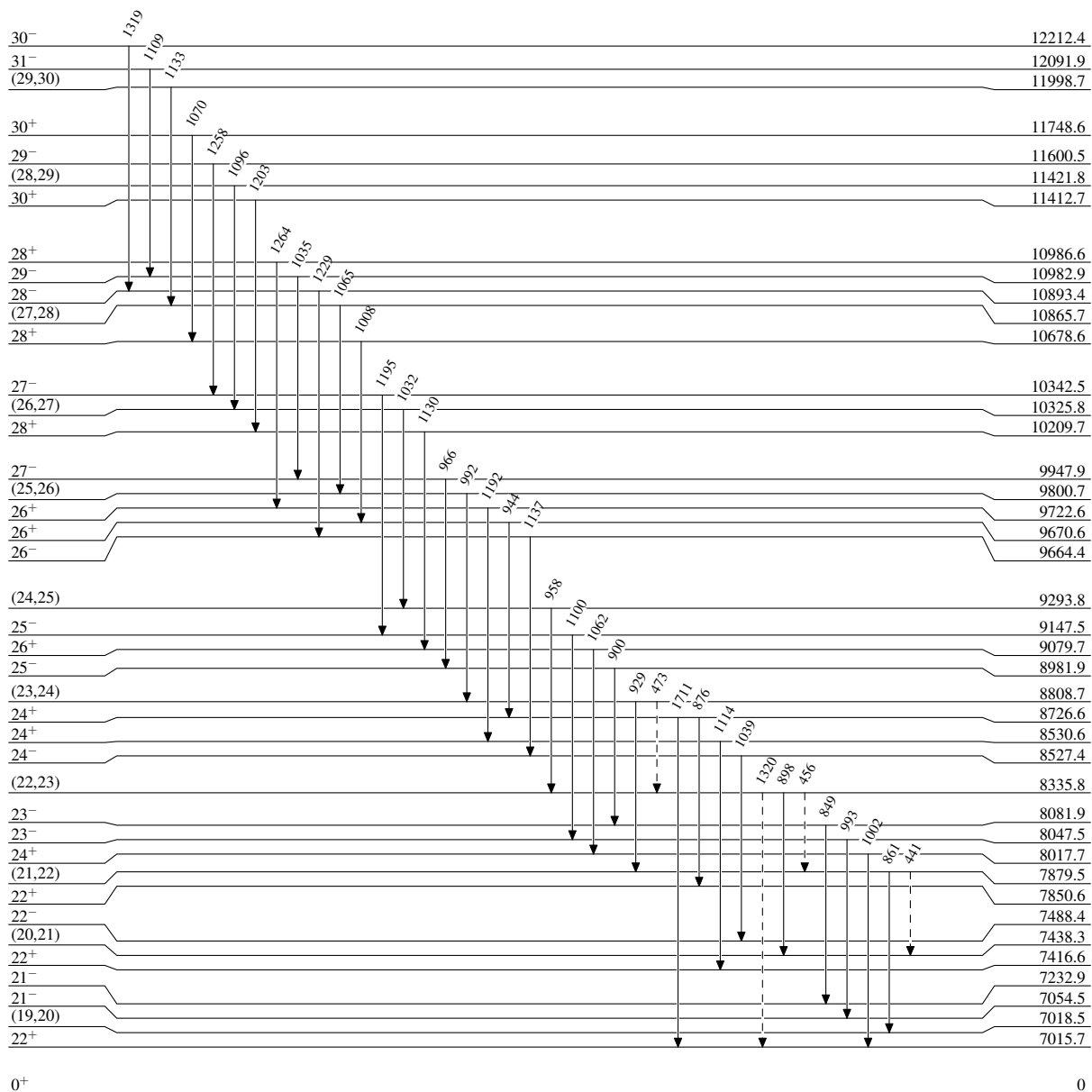
Level Scheme

 $^{132}_{60}\text{Nd}_{72}$

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ 1997Pe27

Legend

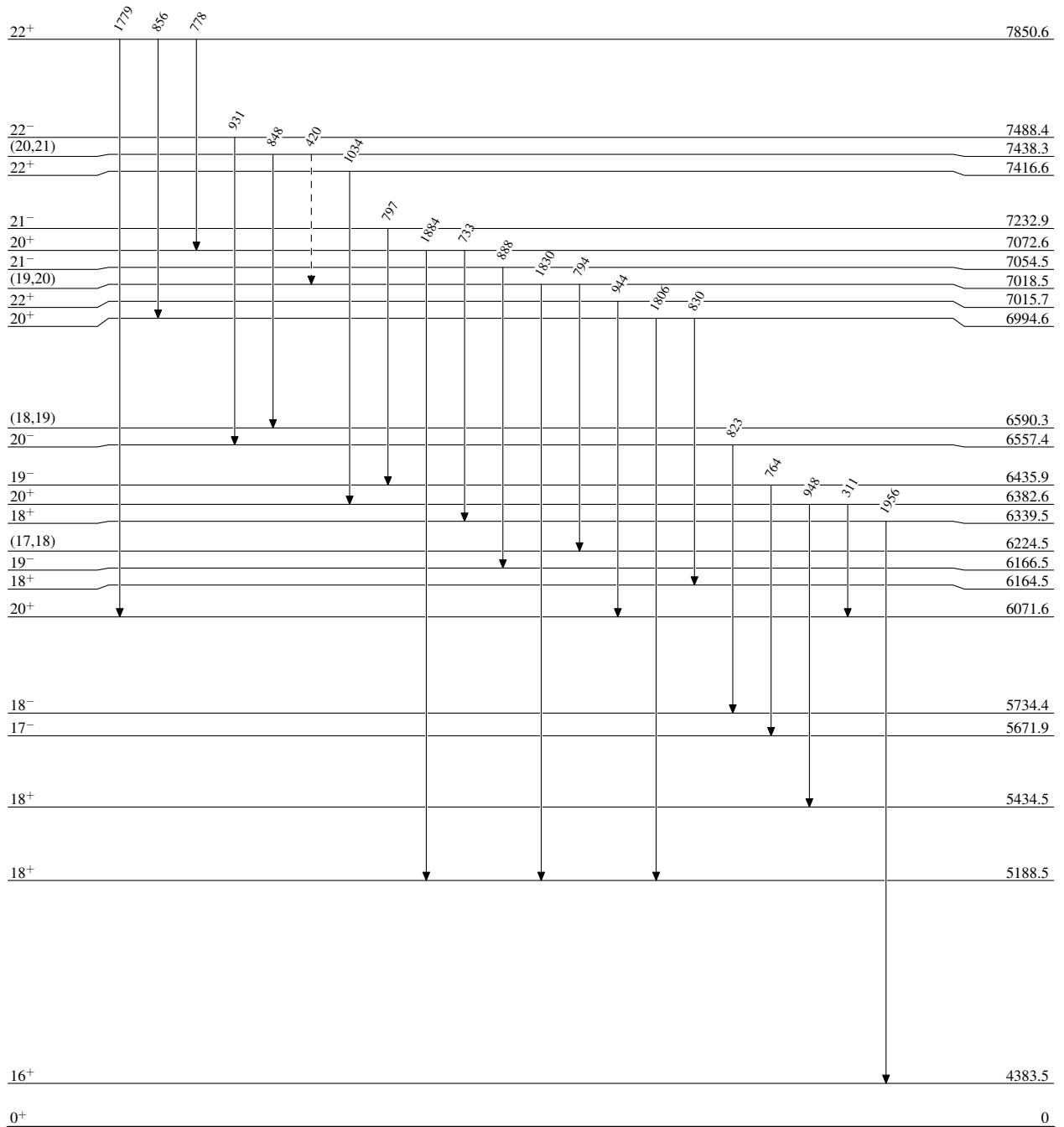
Level Scheme (continued)

-----► γ Decay (Uncertain) $^{132}\text{Nd}_{72}$

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ 1997Pe27

Legend

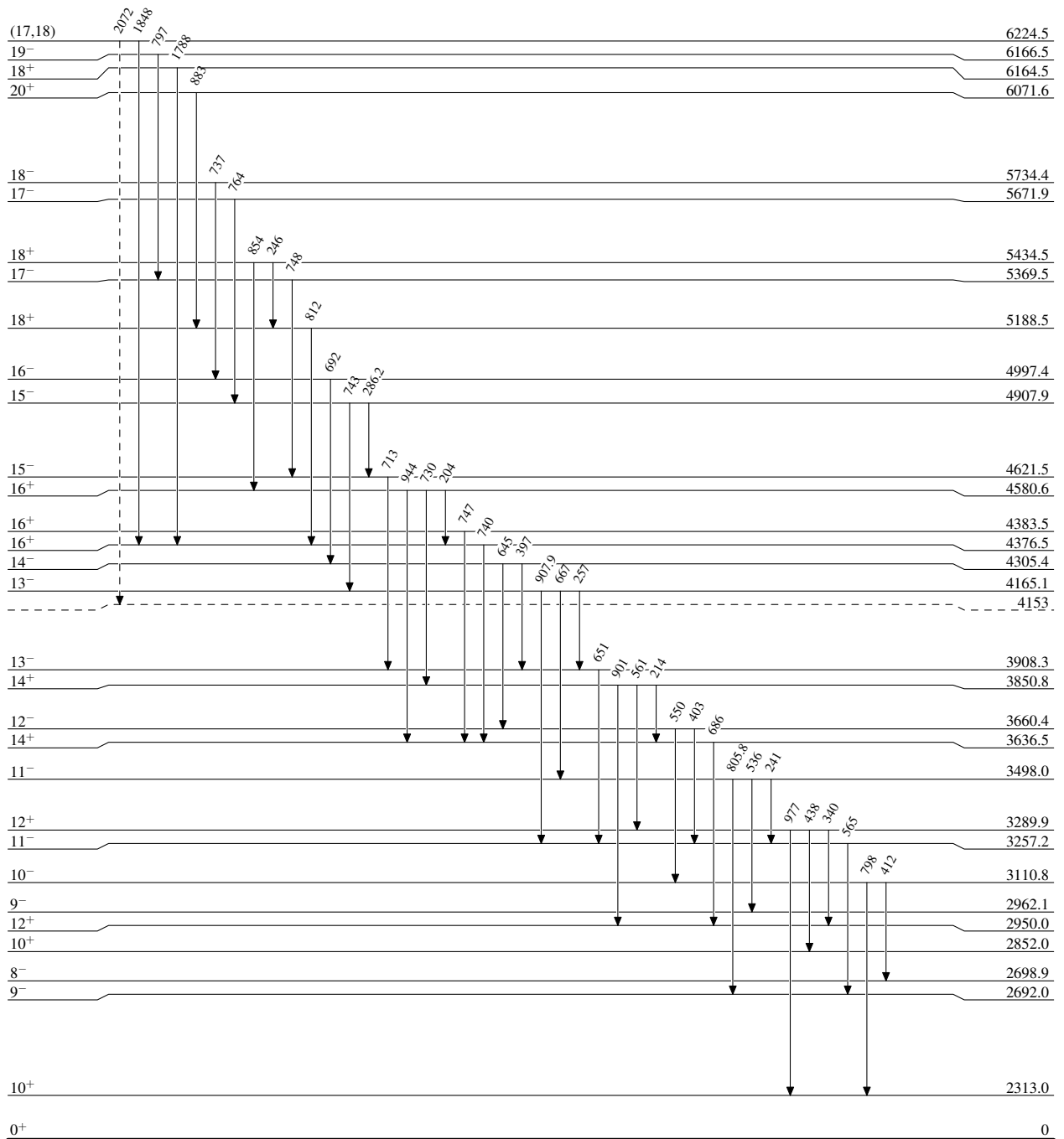
Level Scheme (continued)

-----▶ γ Decay (Uncertain) $^{132}\text{Nd}_{72}$

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ 1997Pe27

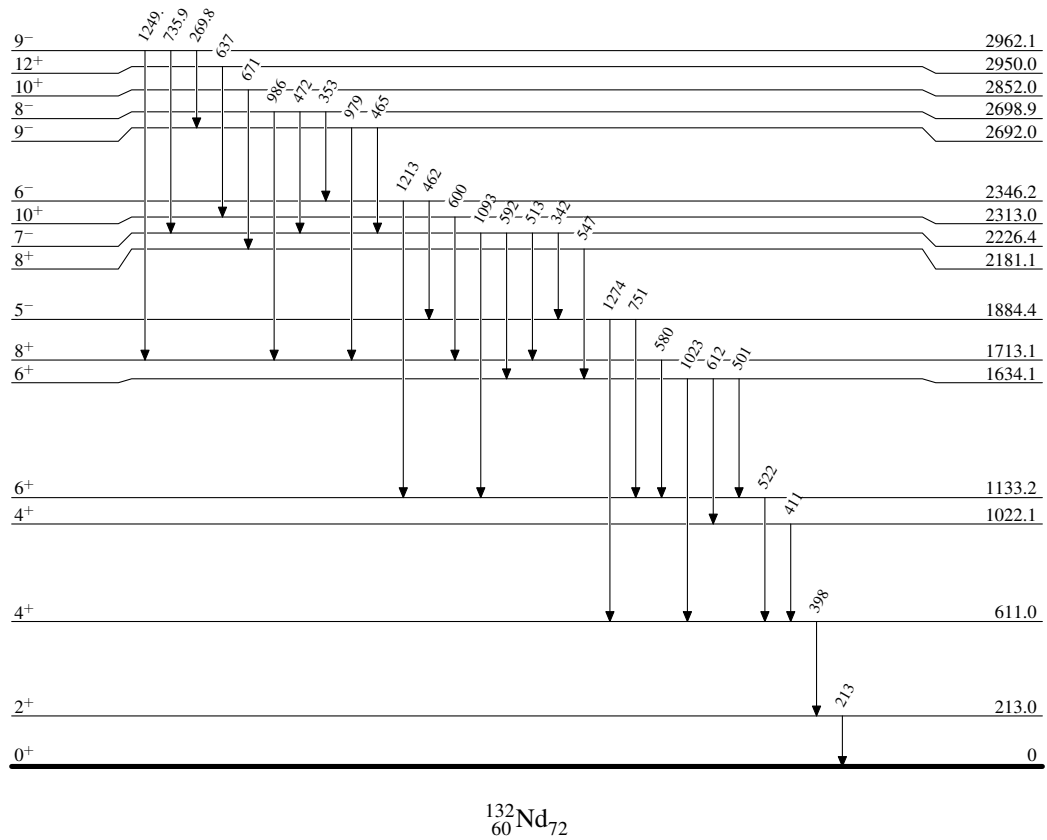
Legend

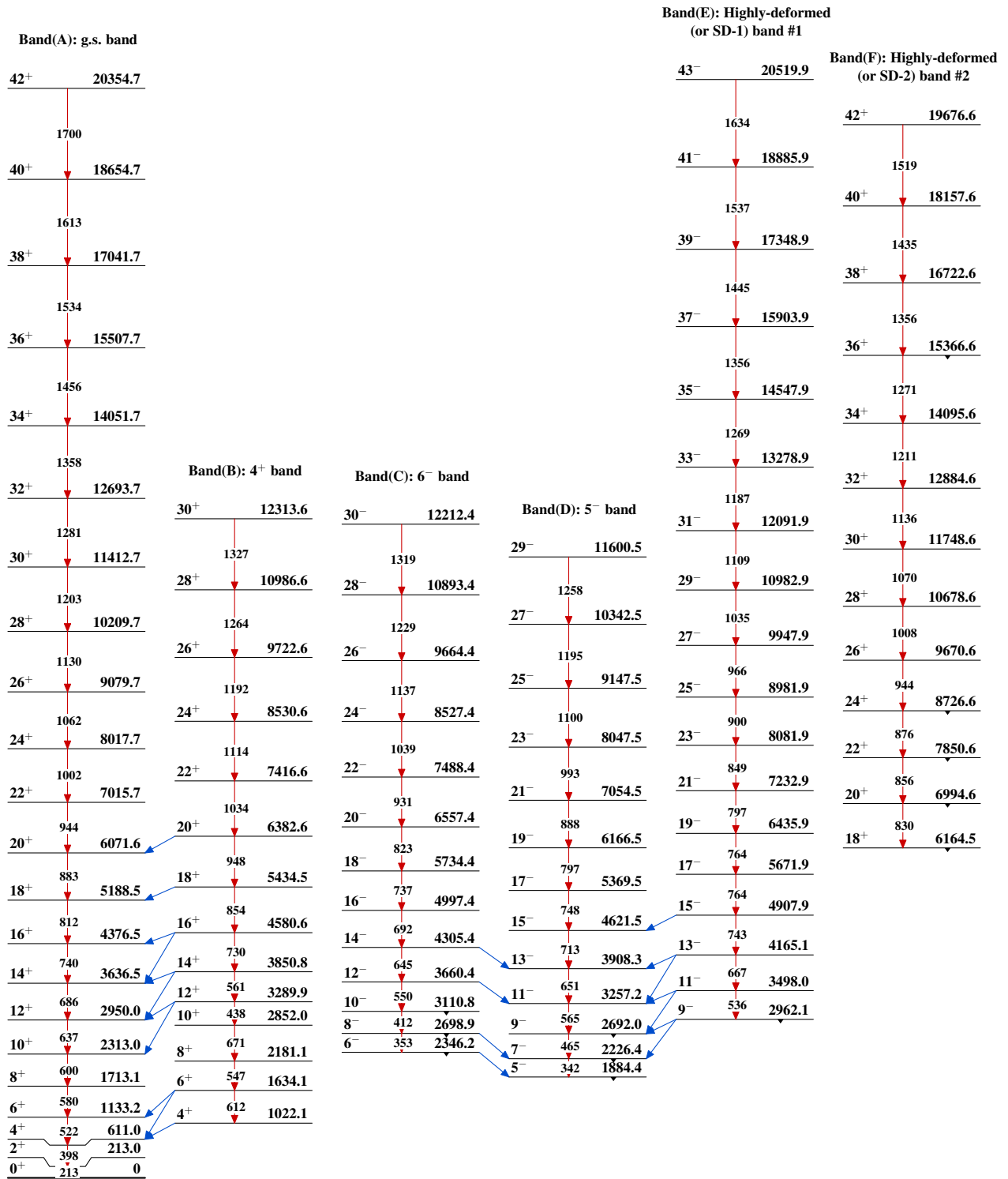
Level Scheme (continued)

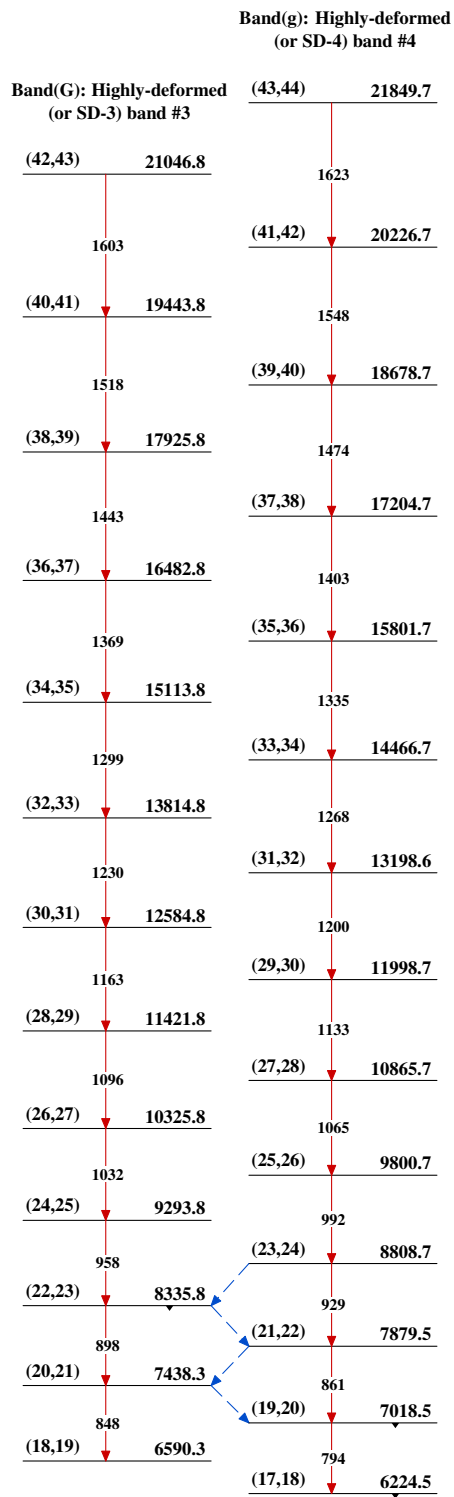
-----► γ Decay (Uncertain) $^{132}\text{Nd}_{72}$

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ 1997Pe27

Level Scheme (continued)

 $^{132}\text{Nd}_{72}$

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ 1997Pe27

$^{104}\text{Pd}(^{32}\text{S},2\text{p}2\text{n}\gamma)$ 1997Pe27 (continued) $^{132}_{60}\text{Nd}_{72}$